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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,051	07/30/2003	Warren M. Farnworth	MICS:0035-3/FLE 97-1008.0	8191
7590 06/16/2004			EXAMINER	
Michael G. Fletcher Fletcher Yoder P.O. Box 692289 Houston, TX 77269-2289			NGUYEN, HA T	
			ART UNIT	PAPER NUMBER
			2812	

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/630,051

Applicant(s)

FARNWORTH, WARREN M.

Examiner

Ha T. Nguyen

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 35 and 54-65 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7-30-3.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 35, 54-55, and 57-60 are rejected under 35 U.S.C. 102(e) as being anticipated by Pierson (USPN 5938106).

Referring to Figs. 2 and 4, and related text, Pierson discloses [Re claim 35] a method of forming solder balls, the method comprising the acts of (a) disposing solder within a plurality of receptacles disposed within a surface of a conveyor belt; and (b) heating the solder disposed within the receptacles to form a solder ball within each receptacle (see col. 3, line 14- col. 4, line 31); [Re claim 54] wherein disposing solder within the plurality of receptacles comprises disposing solder within the plurality of receptacles formed by a first portion 10 of the conveyor belt having a plurality of holes disposed upon a second portion 22 of the conveyor belt; [Re claim 55] wherein disposing solder comprises using a squeegee 70, 72 positioned adjacent to the surface of the conveyor belt to deposit solder within the receptacles (see Fig. 4); [Re claim 57] wherein disposing solder within the plurality of receptacles comprises disposing a desired amount of solder within receptacles (see col. 4, lines 1-7). Pierson does not disclose uniform volume or size, but it shows balls of uniform volume and size (see Fig. 2), inherently the cavities are of uniform volume and size; [Re claim 59] wherein each of the plurality of receptacles have a width greater than a diameter of the solder ball formed within each respective receptacle (see Fig. 4); and [Re claim 60] wherein the conveyor belt comprises one of stainless steel and titanium (see col. 3, lines 4-14 and col. 2, lines 51-65).

***Claim Rejections - 35 USC § 103***

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3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pierson in view of Ference et al. (USP N 5244143, hereinafter "Ference").

Pierson does not disclose wherein disposing solder within the plurality of receptacles comprises disposing solder within non-wettable receptacles. However Ference discloses this feature (see col. 6, lines 10-31). It would have been obvious to a person of ordinary skills to do combine Pierson with Ference to easily remove the solder balls from the receptacles.

5. Claims 61-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pierson.

Referring to Figs. 1, 2, 4, and 5, and related text, Pierson discloses a method of solder balls, comprising the steps of [Re claim 61] wherein heating the solder disposed within the receptacles comprises moving the conveyor belt along a given path through a heater 74, 76 (see Fig. 4). It does not disclose the use of a furnace. However it would have been obvious to a person of ordinary skills to use a furnace to control the heating and to reduce heat loss to the environment.

[Re claim 62] Pierson discloses further comprising cleaning the device, inherently solder balls with a cleaning device positioned downstream of the heating device (see Figs. 2, # 56 and 4).

[Re claims 63 and 64] Pierson discloses a solder ball holder 80 containing solder balls already made. But it does not disclose transferring the solder balls from the conveyor belt to a catch basin positioned downstream of the heating device. It would have been obvious to do so to have the solder balls already made contained in a solder balls holder 80. It is inherent that the step removing the solder balls from the conveyor belt is performed for the balls to be contained in the holder.

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[Re claim 65] Pierson does not disclose wherein removing the solder balls comprises vibrating the conveyor belt to discharge the solder balls from the conveyor belt. However, the examiner takes Official Notice that this is conventionally done to ensure that the balls drop to the desired location at the right time.

Therefore, it would have been obvious to use Pierson's teaching to obtain the invention as specified in claims 61-65.

***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ha Nguyen whose telephone number is (571) 272-1678. The examiner can normally be reached on Monday-Friday from 8:30AM to 6:00PM, except the first Friday of each bi-week. The telephone number for Wednesday is (703) 560-0528.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Neibling, can be reached on (571) 272-1679. The fax phone number for this Group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



Ha Nguyen  
Primary Examiner  
06-10-04